In the drawings:

The attached sheet of drawings includes changes to Figure 1. This sheet replaces the original sheet of Figure 1.

Exhibit 1

08/04/03 08-04-03

617-237-1558

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T-276 P.008/031

Recombinant Neisseria gonorrhoeae RNase P ime Course of Activity

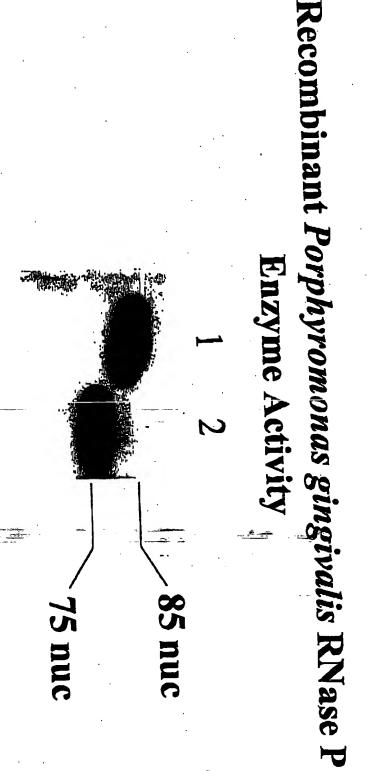
75 nuc

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10 nuc





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FIG. 1

SEQ ID																							
NO.	Residue Number		10	11 12	13	14	15	16	17 1	8 19		46	47	48 49	50 5	1 52	53 5	4 55	56	57	58 5	9 60	61
	Gram Negative Bacteria gamma purple																						
39	Escherichia coli (119)		L	F	L	Т	P	s	٥[،	Т	[ī.	ıГ	E	тГ	7 A	30 3	N	v	R	RГ	ΠН	Ė
40	Proteus mirabilis (119)		L	₹ :-	L	T	P	ĸ	H .	N	[3	I	⊴ L	Т				v	K	R	Н	E
41	Haemophilus influenzae (136)		L	R 1	L	T	P	Ι	Q	ĸ		F] r	T [J ''	1		L			F. Н	
42	Pseudomonas putida (133)		ĸ	K I	L	T	P	R	Н ,	K		i-t		4 L	V	3/1		1 -	٧	K		60200	Q
43	Buchnera aphidicola (114)			K.	L	K	S	T	N I	Q		X		⊕ L	S	S	R		I	K	- 1	Y. H	R
44 45	Salmonella typhi (119) Yersinia pestis (119)	***	L	RI	L	Ť T	P P	A S	H .	Т	1	11	I	C L	T	A	P. O. O. O.	N H	V	R K	R	H	
46	Klebsiella pneumoniae*		L	F. L	L	T	P	s	н			P		el L		A		1	v			A H	
47	Salmonella paratyphi*		I	R L	P	A	T	s	т -			14	1	ı j		A			V			i i	E
48	Vibrio cholerae*		L	R L	L	T	P	E	н	Q		F	- 1	G L	**	· P		' Ω	1	K			G
49	Psauchnonas aeruginosa*		ĸ		L	T	A	R	Q	S		FL	L)	C L	V 🍇		to constitute	7	V	K	_ { ~	<u> </u>	Q
50	Shewanella putrefaciens*		L	A 1.	L	T	P	A	δ [] ĸ	L	<u> </u>	гГ	L	Т	A	1	Y	V	K	R L	V} N	Q
51	alpha purple Coxiella burnetii (121)		w	- ET	R	т	т	А	E	R	ſ	R	ьſ	₃ v	v 🗑	S	1. 2	N	v	D	кΓ	/	W
52	Rickettsia provazekii (121)		T	S	•	N		K		E	L	- L	L	경 I		S	-	1	N	ĸ			v
53	Caulobacter crescentus*		E	3 2		К	R	P	100-	î L		Z		2 F	т				I	G	1.0	- C	E
	epsilon purple				•								_		-	_		_					
54	Heliorhadter pyloni 26695 (161)		D	s	К	N	K	s	E			K		L	s	S	17 -	-	V		1	9. 2	K
55	Helicobacter pylori J99 (161)		D,	S	K	N	K	s		D	C	K	L	.5 L	S	~	1000 CC	-	٧		5 cm	,	K
56	Camphylobacter jejuni*		D	KF	S	T	N	E	E []	S	€	K	1 6	A V	v 🗓	ß s	als i	<u> </u>	V	G	κL	A V	V
57	beta purple Neisseria gonorrhoeae*		Y	R L	L	к	т	D	D s	s s	Г	r;	ıΓ	ੂ r	vΓ	G	K f	Т	Α	ĸ	RГ	ΛN	E
58	Neisseria meningitidis*		Y	33 0	!	ĸ	T	D	D '	s		Jt		G L		G	1 .		Α			* N	E
59	Bordetella pertussis*		A	P. I.	н	R	P	s	E i	à A			L	J L	V			F	Α	A	R	i v	T
60	Thiobacillus ferrooxidans*		D	역 1.	R	Q	K	V	A B	Q		3	L	i L	Α	?] s	R:] -	V	G	N	<u>~ `</u>	V
	Gram Positive Bacteria																						
61	high G & C		!			_		•	~ =	- -	F	70.7	₂ [<u>ন</u> চ	νΓ	7 s	[72] z		v	G	σГ	77 Y	v
6 <u>1</u> 62	Streptomyces bikiniensis (123) Streptomyces coelicolor (123)		N N	KI	R	R R	R R	E E	D I			3 -	- 1	G F	v .	∮ S Z S	KI		v	G	- 1	6. 7	v
63	Microscous luteus (132)		R	A SV	R	T	P	A	E	100		R	1	F		s	1		v		1	V F	T
64	Mychacterium tuberculosis (125)		N	T. M	3	R	s	Α	D)			N		3 L	I I		1)	; -	V	G	S	A V	E
.65	Mycobacterium leprae (120)		N	Y. M	, .	R	s	s	E		5	Ш	V	G L	I	A	K 1		٧		,	7. V	E
66	Mycobacterium bovis (115)		N	K EM		R	s	A	D 3	- 1	[R		O F	I 🔯	2.2	1 1		٧	G	1	P. 1	E
67	Mycobacterium avium*		N	R M	3	R	S	T	E			(B)		G L		J G	1 1		٧	G	,	A V	Q
68	Corynebacterium diphtheriae* low G & C		н	K :	s	N	s	E	δΓ	? R	L	R	F	G L	۷ 🗀	∴ »	<u>к</u>] -	- A	V	G	иГ	A Y	Т
73	Bacillus subtilis (119)		N	f s 3:	lĸ	к	N	E	D	Πο	ſ	R _	vΓ	G L	sГ	√l s	K i	a -	I	G	ΝГ	7A 1/	М
74	Bacillus halcdurans (118)			下歐	к	R	s	D	E			R	v	- L		' s	K		I	G	1	7. Y	T
75	Bacillus anthracis*		н	I. II	K	K	N	D	E	Q		R	Ι	O L G I		/ s			I	G	N .	<u> </u>	٧
76	Mycoplasma capricolum (102)		R	V I	K	K	N	F	E I			<u>K</u> -	Y	S I	s [تاً G			I		- 1	N . 7	Ι
77	Mycoplasma pneumoniae (118)		•	1	R	D	R	K	V 3			R	A V	A V	s s	S	1 1			K		A V	E
78 79	Mycoplasma genitalium (128) Streptococcus pyogenes*		H -	S 1	R	E R	R E	K K	D)	,		, R		AII	120	A / G	1 -	- E	I	K G	- 1	١٠ - ١٠	Q T
80	Streptococus mutans*		Υ	RV	К	s	D	ĸ	D :	ec -		77		G L	tion.	G	comme		L				ν
81	Streptococcus pneumaniae*		F	R	к	R	E	ĸ	D 3		- 1	35		C L	s v	ː s			L	G		A .	T
82	Staphylococcus aureus NCIC*		Y	P. E	К	K		A	D)			R		G I	~ 1	? s			L			s. 7	L
83	Staphylococcus aureus COL*		Y	R 1	К	K	N	A	D	Q	,	Ξ	L		S	ː s	li !	-	L	G	N	7\ \!	L
84	Clostridium difficile* Cyanobacteria	•••	К	G [];	jκ	K	D	S	D [:	R	L		۷L	G I	S	√] S	11 1	<u> </u>	V	G	K [A BUS	Т
85	Synechocystis FCC6803 (124)		t. I	2 1	lĸ	н	w	0	DГ	- T	Г	Ð	гГ	⊕ T	тE	7 s	o Fi	a v	s	ĸ	кE	Т	v
86	Pseudanabaena R006903 (116)		N	R L R L	R	R	R	Ē	D	FA		-R	I	c I	v,	ss	1 1 F	v	s	ĸ	L	r V	T
	Spirochaete	•••																					
87	Borrelia burgobrferi (119)		Ι.	s I.	к	S	K	I	E	Q	[Σ.	I	L) v	Т	s		-	F	R	G _	s∏	K
88	Treponena pallidum (133)		E	R L	R	G	s	C	R 🕦	R	[<u> - E</u>	F	L) A	T 🔝	R	R	; -	Y	G	K[F ''	Α
0.0	Chlamydiae		- I	71 7	١.	1,		1,	<u>.</u> Г		5	177	F	- 77 +	m []	٦.	74 3	7	Б	~	νΓ	- L 11	^
89 90	Chlamydia trachomatis (120) Chlamydia trachomatis MbPn*		A	n t	ī.	ĸ	R R	ĸ		V	})	ν̈́Ι	J V	T .	,] [r	G	ĸ	a H	0
91	Chlamydia pneumoniae (139)	•••	s	R I R I R SV	L	K	R	ĸ	0	L		The second	м	SI	T -	S	11. 5] _	F	G	ĸ.	н	E
. –	Thermotoga																						
69	Thermotoga maritima (117)		Ε	RU	R	L	R	R	D [] r	[R	г[⊡ I	v [7 к	R!] -	F	G	κ[ΛT	R
	Bacteroides		_ 1		1 -	_	_	_	_ 800	3 7		_	, gc						_				•
70	Porphyranonas gingivalis*		E	R L	ĮΥ	Ļ	R	D	E 📉	N		s	M	U V	s ['	<u>ا</u> A	12 1	IJ R	F	R	R L	<u>v v</u>	K
71	Deinococcus radiodurans*		_	- 🗓	þ	G	F.	R	E	ı P	Г	8	тΓ	⊙] т.	v٢		5 1	7 m	Ţ.	ĸ	нΓ	A +31	ĸ
, 1	Green-Sulfur																						
72	Chlorobium tepidum*		A	79 70	k	G	G	-	- [L	[Χ	νē	I F	T	∄ G	K	L	٧	P	R [. V	D
	% Identity			79 70					8	9		83	7	95	7	2	89 7	0			9	98 70	



FIG. 1 Continued

SEQ ID NO.	Residue Number	62 63	64	65 66	67 (68 6	59 70 1	71	- 8	so –	_ 8	14 - 1	35 – -	- 86	87	_ 101	102	103	104 -		105 _	
	Gram Negativa Bacteria gamma purple																					
39	Escherichia coli (119)			I	- 1			Ε.	[리-	<u>-</u> [7-	F	- 7	v	-[-]	s	E	Α -		1.	••
40	Proteus mirabilis (119)	25.1.250		I I	• 1	L A	F 1	E.	}	-	-	1 -	F		V F		T A	E Q	v -	- -		-
41 42	Haemophilus influenzae (136) Pseudomonas putida (133)	# 14	R	-	i	r i	1 1	E. D.	-]	. _	-		r I		I	- E	H	Q	н -		F	
43	Buchnera aphidicola (114)	7 N		I			1 1	E.		. _	-	r -	- F	- 2	v	4	v	N	Ι.	- -		
44	Salmonella typhi (119)	X	R	I .		L '	F 5	Ε.		-	-	/ -	F	-	V	_ [5]	s	E	Α -			
45	Yersinia pestis (119)	2 11	R	ł	1	L !		E.		-	- 1		F	1 1	V	-[3]	T	E	Α -		- -	
46 47	Klebsiella pneumoniae* Salmonella paratyphi*	1 H	R R	ī		L : L :		E. E.	-]		-	: <u>-</u>	F		V V	- 7	s s	E E	A -			
48	Vibrio cholerae*	- N	R	- 1	- 1	I	1 1	E.		- -		5 -	- F	- -	v		F	N	L -			
49	Pseudomonas aeruginosa*)	R	L (-8	L	1	E.	[্ৰী-	_ [<u>- ای</u>	I	- [v]	v	_ 24	Н	Q	Q -	- -	- E	
50	Shewanella putrefaciens*		R	I	1,	V	I []	D.	[_	<u>r</u> } –	- L	<u> </u>	I		v		N	K	L -		-	
51	alpha purple Coxiella burnetii (121)		R	VR		v '	v 🖹	r		.]-	Г	a –	ı	- 177	v		Y	E	c -	. .	Ti.	
52	Rickettsia prowazekii (121)	too les outes	ĸ	B	. ,			H.	-	S N		_	I	1	I		Q	Y	E -			
53	Caulobacter crescentus*	. 4		A I			1 1	E .		_	_ [Y	-[]	F	_	L	D		/KT#	ـ انـا	
	epsilon purple													_								
54	Helicobacter pylori 26695 (161)	0 5		I	1	R :		s.	-	CQ	-		L	- F	F	- Z	E	K		FLEN	1 1	••
55 56	Helicobacter pylori J99 (161) Camphylobacter jejuni*	4 E		I II			1 1	S. A.		ြစ္		A - K -	L	7	F F	_ 3	E E	K K		LKWO		•
50	beta purple		•	ـــا "	لنت		نت -	•• •		~	- '	••	•	L.221	•	لتا-	~				- لتبا	
57	Neisseria gonorrhoeae*	7 1.	Y	м	12	v :	I R	D.	[্ৰ –	- [– اد	F	- 57	v	_ A	R	A	E -		·[7] .	
58	Neisseria meningitidis*	¥	Y				1 1	D.	- 1	. –	- '	1	F	- ~	V	- '.A	R	A	E -		. S	•-
59	Bordetella pertussis*			L .	- 1			E. E.] - r -			Y V		v v	- 1	K G	R	S F	ARAE	- W	-
60	Thiobacillus ferrooxidans* Gram Positive Bacteria		R	<u> </u>	لت	к.	r [3]	E.		1 -	- L	<u> </u>	v	ا سازی	٧		G	A	1 -		- لتا	
	high G & C																					
61	Streptomyces bikiniensis (123)	-	Q	V 3	2	R	r F	н.	[₽	_ 1	L -	v		٧	_ L	A	R	D -		- 🔟 -	
62	Streptamyces coelicalor (123)			<u> </u>	. 1	R		H .	-	7 5	-	L -	v	<u> </u>	v	- 12	A	R	D -		- "	••
63 64	Micrococcus luteus (132) Mycobacterium tuberculosis (125)	H	R R			R :	1.0	A. H.	-]	P H		S H	v	- 0 - गि	V		R E	R Q	E 7	r V G <i>I</i>		
	Mycobacterium leprae (120)	TH		V A		R	F 1	н.		G	_	- 1	v	1.1	ī	_ \ Z	A	Q	<u>ν</u>		anes T	
66	Mycobacterium bovis (115)	н	R	V A	D.	R :	1 1	н.	:	Н	_ ;	ЭН	v	- v	I	_ []	E	Q	Q -		T	
67	Mycobacterium avium*	H		V A	•		1 1	н.	_ }∽	E B			L	1 1	I	- 74	A	Q	E -		L -	
68	Corynebacterium diphtheriae* low G & C	H.	R	v s	لع	Ω:	r [3]	н.	<u>L</u>	<u> </u>	_ '	н -			V		R	A	D V	/ Q A /	- لنــــــــــــــــــــــــــــــــــــ	
73	Bacillus subtilis (119)	7 :	R	1 3	JE.	L :	ı 🗊	Q.	[:	Īκ	_ [7	<u> </u>	Y	FE1	τ	_ т	ĸ	ĸ	s -		<u> </u>	
74	Bacillus halodurans (118)	1 h	R	1				T .			_	n –	Y	-	1	- 20	ĸ	G	s -		<u> </u>	
75	Bacillus anthracis*		R		- 1	M :	1 1	Q.		D	-	D -	F	V	I	- T.	K	ĸ	s -		Ti-	
	Mycoplasma capricolum (102)	1 :1	K				76.25	Μ.		I G	- :	1	I	1	I	ليا۔	s	K	L -		571	••
	Mycoplasma pneumoniae (118) Mycoplasma genitalium (128)	1. 13	L L	I R I K		Q '	-0.0	A. S.	- [N E	- [0 -	v - - I	型	V V	_ K _ K	Q Q	T K	I -	 		•
79	Streptococcus pyogenes*	7		v ir	- 1	ĸ:	1 1	н.			<u> </u>	-	- F	- 7	v		Q	Q	N -			
80	Streptococcus mutans*	1. 0	A	I 7	Ħ	K I	L B	н .	[:	r]G	_ [<u>- اد</u>	F	-[√]	v	_ M	ĸ	K	n -		7.	
81	Streptococcus pneumoniae*	1.0	_	IK	- 1	R	1 1	н.		V	- :	i i	F	- 2	V	- M	Е	K	N -		T	
82 83	Staphylococcus aureus NCTC* Staphylococcus aureus COL*		K			A :		E.		L	- :		I		V	- 3	Q	N N	S -		- I	
84	Clostridium difficile*		R	VR	.,	L	I K	 E :	- ĸ	K		-	I		F		ĸ	N			-	-
	Cyanobacteria																					
85	Synechocystis PCC6803 (124)		R	L K	اها	Q:	I R	Α.	2	K	- L	의 -	v	Ų.	I	- 3	L	R	E -		<u>I</u> -	
86	Pseudanabaena PCC6903 (116)	لــــا	R	F _ ~	-3.1	Q I	LR	Α.	L	K	_ (2 -	I	173	٧	- 7.	G	Đ	D -		-	••
87	Spirochaste Borrelia burgdorferi (119)		R	ı 🔐	73	L I	FK	E	-[]	ΠE	<u></u>	e] _	r	(F)	F	T	E	s	L -	- - -	M	
88	Treponema pallidum (133)	. T	R	AR	.?	L s	s ĸ	E .	L	v	<u> </u>	<u> </u>	L	- "	L	_	L	С	v -		<u> </u>	
	Chlamydiae								_	_											Program	
89	Chlamydia trachomatis (120)		R	F .		I '	V	E .	;	u] -	_ (2 -	V	Y.	Ι	-	S	E	EI	LQF	1 AIN -	,.
90 91	Chlamydia trachomatis MoPn* Chlamydia pneumoniae (139)	-0-0-0	R	F 3	. P.	י נ עע	V 3	E.	-]	-1-	- () -) -	v T		v	-1.71	S T.	Α	ים דת	. L K F		
91	Thermotoga									_												
69	Thermotoga maritima (117)		ĸ	L	\mathbb{R}	w	v 🗔	Е.	[<u>-</u>	- C	<u> </u>	1	Ų	v	_ (v.	R	Е	к -			
	Bacteroides																					
70	Porphyromonas gingivalis*	لنـــا	R	V [35]	Ÿ	L'	v 🔣	Ε _	L	<u>.</u>] –	ـا -	<u>)</u> -		- 7	L	- []	P	D	F F	TVE	. R _	•
71	Deinococci. Deinococcus radiodurans*		R	A R	28	R 1	ν	E	-۲	Jr.	1	R -	A	(F)	L	T.1	А	0	ΑТ	ORG	(A) .	
••	Green-Sulfur									_												
72	Chlorobium tepidum*		R	I K	R	L	M 🐷	E .	C	T	- C	э н	ω	V	-	_	E	R	F F	RAIF	н _ 74	
	% Identity	100 89		79	100		91		7	4	7	5		77		68					74	